Ethnobotanical studies in the genus *Sansevieria* Thunb. (Asparagaceae) in Zimbabwe

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Research

Abstract

A study investigating ethnobotanical uses and ethnotaxonomy of the genus *Sansevieria* Thunb. (Asparagaceae) in Zimbabwe is presented. Direct observation of plant use by informants, open-ended and informal interviews covering questions on local names of species, uses, mode of administration and the specific plant part used were employed during the study. Ethnobotanical uses for four species; *Sansevieria aethiopica* Thunb., *Sansevieria hyacinthoides* (L.) Druce, *Sansevieria kirkii* Baker and *Sansevieria pearsonii* N.E.Br. were recorded from 60 informants. A total of 11 use categories were defined; ornamentals, medicinal use in humans, medicinal use in animals, food, play, processed fiber, unprocessed fiber, crafts, making whip ends, spiritual uses and other uses. Medicinal use in humans was the most prevalent category, contributing 33% of the total responses. Several uses of *Sansevieria* in Zimbabwe not previously documented in the literature are described for the first time in this study.

Introduction

Sansevieria is a genus of xerophytic perennial herbs that occur mostly in dry tropical and subtropical habitats. About 70 species are known with a distribution range from Africa, Asia to Burma and the islands of the Indian Ocean. (Alfani *et al*. 1989, Purseglove 1972). Members of the genus *Sansevieria* are known by various common names such as bow string hemp, snake plant, zebra lily, mother in law's tongue, leopard lily, devil's tongue, and good luck plant to name a few. (Agnew 1974, Cutak 1966, Everett 1982, Koller & Rost 1988, Pfennig 1979, Takawira-Nyenya 2006, Turril 1959).

Sansevieria species are primarily known worldwide for their cultivation in gardens, in pots, as indoor plants and on rockeries as ornamentals. Sansevierias are among major foliage ornamentals in the world owing to their succulent leaves, the wide range of leaf shapes and sizes, the variation in color that ranges from plain green to variegated and mottled leaves and their ability to tolerate drought and neglect. Other uses of *Sansevieria* include manufacture of rope, fishing lines, cordage, fine matting, bowstring and clothing (Everett 1982, Gangstad *et al.* 1951, Mbugua & Moore 1996). Table 1 presents some uses of *Sansevieria* reported in literature from various parts of Africa. Leaves are the parts most often used. Van Wyk & Gericke (2000) also mentioned the use of the rhizome of *Sansevieria hyacinthoides* (L.) Druce for medicinal use. Watt & Breyer-Brandwijk (1962) reported on the use of *Sansevieria* fiber for binding fractures and for making ceremonial garb. Leighton (1917a,b) reported on the use of *Sansevieria* fiber in paper making but included no further details on the use. Although various uses of *Sansevieria* species have been reported in some literature sources prior to this study, information on the mode of administration, specific plant parts used and exact localities of mentioned species were often not included.

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Table 1. Ethnobotanical uses of *Sansevieria* species reported from various countries in Africa.

Species	Region	Ethnobotanical Use	Method of Use	Citation
Sansevieria aethiopica Thunb.	Botswana	Increase appetite in children	Root powder is given to children twice a day.	Hedberg & Staugård 1989
		Treatment of earache	Root extract is squeezed in ear.	
		Treatment of wounds and sores	Leaf extract is squeezed directly onto wound/sore.	
Sansevieria bagamoyensis N.E.Br.	Tanzania	Treatment for convulsive fever	Filtrate from pounded leaves is taken orally and the residue applied to the body.	Chhabra *et al*. 1987
Sansevieria cylindrica Bojer	Congo	Charm plant	The entire plant is used.	Watt & Breyer-Brandwijk 1962
Sansevieria hyacinthoides (L.) Druce	South Africa	Treatment for ear infections, ear aches and tooth ache	Leaf is cut and heated. Warm juice is squeezed into aching ear or tooth.	Van Wyk & Gericke 2000
		Treatment of haemorrhoids, ulcers and intestinal worms, stomach disorders, diarrhoea	Fresh or boiled rhizome is chewed and the juice swallowed.	
		Treatment of haemorrhoids, expulsion of intestinal worms	Portion of root is chewed and swallowed, or boiled root is eaten by the patient.	Watt & Breyer-Brandwijk 1962
		Prevention of miscarriage	Infusion of root is taken orally	Watt & Breyer-Brandwijk 1962
		Protection against lightning		
	Tanzania	Treatment of earache and toothache	Leaf is gently heated and exuded liquid is dropped into aching ear or on aching tooth.	Watt & Breyer-Brandwijk 1962
Sansevieria intermedia N.E.Br.	Kenya	Treatment of sexually transmitted diseases e.g., gonorrhea	The stem is boiled in soup.	Kiringe 2006
Sansevieria kirkii Baker	Tanzania	Treatment of wounds	Powdered root applied to wound.	Watt & Breyer-Brandwijk 1962
	East Africa	Purgative	A rhizome decoction is used.	Watt & Breyer-Brandwijk 1962
Sansevieria liberica Gérome & Labroy	Southern Benin	Combating malaria	Roots are used as a mixture component to combat Malaria.	Hermans *et al*. 2004
Sansevieria parva N.E.Br.	Kenya	Treatment of snake bite wounds	Leaf sap is applied on snakebite wound.	Owuor & Kisangau 2006
Sansevieria pearsonii N.E.Br.	Zimbabwe	Treatment of toothache	Leaf extract is dropped on aching tooth.	Gelfand *et al*. 1985

Ethnobotanical uses of *Sansevieria* in Zimbabwe are poorly documented, and only a few reports exist in the literature. Brown (1915), in his extensive taxonomic account on *Sansevieria*, recognized over 50 species. He made one reference to the use of a species of *Sansevieria* from Zimbabwe (then Rhodesia), namely *S. pearsonii* for fiber. In their book, The Traditional Medical Practitioner in Zimbabwe, Gelfand *et al*. (1985) mentioned the use of only one *Sansevieria* species, *Sansevieria desertii* N.E.Br., (now synonymous with *S. pearsonii*) for the treatment of ear ache.

The aim of this study was to document the indigenous knowledge on the uses of the genus *Sansevieria* by various ethnic groups in Zimbabwe, and to present information on methods of use. The local names used for the various species and a discussion of potential threats to *Sansevieria* species in Zimbabwe are also included.

Figure 1. Zimbabwe and known localities of *Sansevieria* from herbarium collections and new observations during the current study.

The study area

Zimbabwe is a landlocked country in Southern Africa. Figure 1 shows its geographical location and the localities visited during the study. Zimbabwe's population is divided into two major linguistic groups; the Shona and the Ndebele. Shona speaking groups include a number of sub-ethnic linguistic groups; the Karanga, Manyika, Ndau, Tonga, Venda, Nambya and Kalanga, among others as outlined in Chebanne *et al*. (2006)'s classification. Most sub-ethnic groups are concentrated near Zimbabwe's neighboring countries, with the Tonga in the south eastern part, the Venda in the south and the Kalanga in the south west.

Methods

Ethnobotanical data were collected among various ethnic groups and geographical regions of Zimbabwe mainly

in the period from 1997 to 1999, and also during collection field trips conducted in 2004, 2005, 2007 and 2009. Prior consent was obtained from the informants prior to the study.

A modified version of snowball sampling (Tashakkori & Teddlie 2003) was used in identifying key informants through village heads, headmen or chiefs. They suggested key informants who were knowledgeable about *Sansevieria* and were involved with its use. These village leaders also granted the authors permission to carry out research in their respective areas. Participatory observation, open-ended and semi-structured interviews were used as modified from Cunningham (2001), Martin (1995) and Cotton (1996). Local plant names were used as prompts at the beginning of the interview in order for the informants to understand which plants were in question. Another method employed was to show the informants a *Sansevieria* specimen that had been collected from the area or from other villages visited earlier, and ask them if they recognized the plant. Responses to questions covering aspects on local names, uses and methods of administration were recorded. Interviews were conducted by the first author who is conversant in both Shona and Ndebele, and with the help of an interpreter in areas where ethnic groups used dialects that were not familiar. Demographic data of respondents including age and gender were also collected. Part of the field work was carried out at a time of political unrest in the country and some respondents felt intimidated to have their personal details recorded. In such cases, estimates of the ages were used.

Data were collected from 60 independent events where an event is defined as the process of asking one informant on one occasion about their knowledge on the use of any *Sansevieria* species as defined by Phillips & Gentry (1993). Where the same response was given by the same person on the same species, but at different localities, the informant's responses were combined into one entry. Voucher specimens are deposited at the National Herbarium and Botanic Garden (SRGH) in Zimbabwe. Data analyses were carried out using Microsoft Office Excel 2007.

Use categories

To prepare the data for quantitative analysis, all ethnobotanical data gathered were placed into 11 use categories; ornamental use, medicinal use in humans, medicinal use in animals, use for food, use for play, use of processed fiber extracted from the plant leaves, use of *Sansevieria* leaf strands as rope without prior processing of the fiber, making crafts, making whip ends, spiritual use and 'other uses category'. These categories were based on the authors' perspective and understanding of the ethnobotanical data. The categories were created to facilitate the analysis of data as defined by Phillips & Gentry 1993 and Prance *et al*. 1987.

Results

A total of 60 respondents contributed data on ethnobotanical uses of *Sansevieria* (Table 2). The data re-

Table 2. Ethnobotanical uses and use categories of *Sansevieria* from interviews with 60 informants in Zimbabwe. Each row represents one respondent. The parts used are classified as: lf (leaf); rh (rhizome); ep (entire plant); fr (fruits); or ro (roots). Flora Zambesiaca divisions are defined by Pope & Pope (1998): N (north), W (west), C (central), E (east), and S (south). Voucher specimens are deposited at the National Herbarium and Botanic Garden in Harare (SRGH). Specimens already collected or photographs of these were sometimes shown to the informants as prompts during the interview (In such cases the voucher number is marked with an asterisk), hence for some responses, voucher specimen numbers are repeated while for some, no voucher specimens were collected.

Respondent #	Species (voucher)	Use Categories											Part used	Explanation of use and mode of administration	Flora Zambesiaca region: Location
		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
1	*Sansevieria hyacinthoides* (L.) Druce (Takawira 37)						x		x				lf	Making mats, weaving sunhats, and making briddles for horses.	E: Manzvire, Chisumbanje
2	*S. hyacinthoides* (Takawira 5*)		x										rh	Rhizome boiled, steam inhaled for treatment of wide range of ailments.	S: Buhera, Dewure

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		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
3	*S. hyacinthoides* (Takawira 5*)		x										lf rh	Leaf or rhizome is crushed and squeezed, (sometimes material is first shoved into the fire) and exuded sap given to child suffering from dehydration.	S: Buhera, along Birchnough Murambinda Rd.
4	*S. hyacinthoides* (Takawira 5*)		x										lf	Leaf chewed to macerate the cells and cell sap is given to a colicky new born / infant.	S: Buhera, along Birchnough Murambinda road
5	*Sansevieria kirkii* Baker (Takawira 46)						x	x				x	lf	Unprocessed fiber is tied end to end and used for tying thatching grass. Fiber is extracted and intertwined to desired length and thickness for use in trapping birds.	N: Binga, Sinampande
6	*Sansevieria pearsonii* N.E.Br. (Takawira 44)					x	x	x					lf	Used to make rope for play, and for making volley ball nets. Leaf strands tied end to end for tying firewood and thatching grass while processed fiber is used during thatching for attaching the grass to the poles, with fiber saving the purpose of nails.	N: Binga, Sinampande
7	*S .kirkii* (Takawira 45*)		x				x						lf	Treating sore eyes. Also for making rope.	N: Binga, Sinampande Primary school
8	*S .pearsonii* (Takawira 17)					x	x						lf	For making string and rope for building. Rope used by children in playing games that require rope like volley ball nets.	N: Binga, Kalungwizi
9	*S. hyacinthoides* (Takawira 37)						x		x				lf	For making mats, sunhats and bridles for horses.	E: Manzvire, north of Chisumbanje
10	*Sansevieria aethiopica* Thunb. (-)										x		ep	Grown on graves.	W: Kezi, near Shashani school

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		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
11	*S. pearsonii* (Takawira 44*)											x	ep	Plant is potted and hung in pigeon run for pigeons to feed on the flowers.	N: Binga, Samende Primary school
							x		x				lf	Leaf fiber used in weaving washing baskets and for sewing reed mats.	
12	*S. kirkii* (Takawira 46*) or *S. pearsonii* (Takawira 44*)		x										lf	Taken by pregnant women for alleviating labor pains.	N: Binga, Kamati area.
13	*S. pearsonii* (Takawira 55)				x		x						lf	Leaf eaten by livestock especially during drought. Fiber is extracted from the leaf and intertwined into rope of desired thickness that is used during roof thatching for tying thatching grass onto pole during construction.	W: Matopos, Whitewaters Primary school.
14	*S. pearsonii* (Takawira 55*)									x			lf	For making whip ends.	S: Gwanda, Greenzonke, Jeka farm
15	*S. aethiopica* (Takawira 56)						x						lf	For making rope.	S: Gwanda, Greenzonke Jeka farm
16	*S. pearsonii* (Takawira 57)						x	x					lf	Tying firewood and thatching grass. Fiber is extracted and used in the same manner as nails in construction of thatched roofs.	S: Gwanda, Stanmore
17	*S. pearsonii* (Takawira 58)		x										lf	Used for treating ear infections. The leaf is put in fire and the sap exuded is squeezed into infected ear.	W: Esigodini, Sizhube
18	*S. hyacinthoides* (Takawira 37*)		x										lf	Used for treating ear infections. The leaf is put in a fire and the sap exuded is squeezed into infected ear.	W: Esigodini, Sizhube
19	*S. hyacinthoides* (Takawira 37*)											x	lf	Fiber extracted from a leaf is tied around a sprained ankle.	W: Esigodini, Sizhube
20	*S. pearsonii* (Takawira 57*)										x		lf	Young leaves used to beat drums for cultural dance.	W: Filabusi, Wanezi

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		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
21	*S. pearsonii* (-)											x	lf	Trap termites eaten as relish in a staple dish.	S: Chivi, Tarukwasha village
22	*S. pearsonii* (-)						x						lf	Fiber is extracted and intertwined to desired thickness for making strings and ropes.	S: Chivi, Madzivire
23	*S. hyacinthoides* (Takawira 68)											x	ep	Plant is potted and hung in a pigeon run for pigeons to feed on the flowers.	S: Chivi, Maringire
24	*S. hyacinthoides* (Takawira 68*)						x	x		x			lf	For making fiber and mats and for making whip ends that make the whips produce a sharp sound.	S: 80km from Masvingo, along Masvingo Beitbridge road
25	*S. hyacinthoides* (-)		x										lf	Used to treat premenstrual tension, stomach pains and syphilis, used as a purgative by polygamous men to avoid transferring venereal diseases from one wife to another.	E: Chipinge, Gwenzi area
26	*S. hyacinthoides* (Takawira 72)						x	x	x				lf	For making fiber and mats.	S: Lundi, Chehaya area
27	*S. aethiopica* (Takawira 76)		x										lf	For treating ear infections. Any part of the leaf is put in a fire and the exuded sap is squeezed into the ear.	S: Beitbridge No. 2 area, near Machiloni
28	*S. aethiopica* (Takawira 80)							x	x				lf	Leaves are gently macerated using a stone and the leaves are used for making mats.	S: Beitbridge, near Makakabula school
29	*S. hyacinthoides* (Takawira 81)		x								x		lf	The leaf is crushed, boiled in water and mixture given to a victim of poisoning through witchcraft.	S: Gwanda, Manama, Fumugwi area
30	*S. aethiopica* (Takawira 82)				x								lf	Leaves eaten by cattle during drought.	S: Gwanda, Bethel village
		x										x	ep	Planted on homesteads as ornamentals and to scare off snakes.	

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		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
31	*S. aethiopica* (Takawira 83)						x						lf	Used for making fiber.	S: Gwanda, Mawulu No. 2 area
32	*S. aethiopica* (Takawira 87)		x										lf	Leaf used for treating ear infections. The tender, white bottom of leaf is shoved in fire and exuding sap squeezed into the painful ear.	S: Gwaran-yemba
33	*S. pearsonii* (Takawira 57*)			x									lf	Leaves are crushed and the sap given to cattle suffering from backflow of stomach acids.	W: Filabusi, Mahole
34	*S. pearsonii* (Takawira 57*)			x									lf	Crushed leaf is mixed with *Clerodendrum glabrum* E. Mey. leaves and water, and the mixture given to female livestock (especially goats) to increase fertility.	W: Filabusi, Mahole
35	*S. hyacinthoides* (Takawira 86)		x										lf	Leaves crushed and added to bathing water for a measles or cold bite patient.	W: Filabusi, Mahole
36	*S. hyacinthoides* (Takawira 86*)			x									fr	Berries crushed and added to poisoned dog's food so it can vomit the poison.	W: Filabusi, Mahole
37	*S. pearsonii* (Takawira 88)										x		lf	Leaf used in beating drums during an ancestral worship dance locally known as **umgido wamabhiza** – 'the horses dance'	W: Matopo, Kezi
38	*S. aethiopica* (Takawira 90*)		x										lf	Treatment of earache. Leaf put in fire and sap exuded squeezed into painful ear.	W: Maphisa, Near Antelope Rd.
39	*S. aethiopica* (Takawira 90*)		x										rh	Treatment of earache. Rhizome put in fire and sap exuded squeezed into painful ear.	W: Kosted farm, Collenborne
40	*S. aethiopica* (Takawira 100)		x										rh	Treatment of toothache. The base of leaf is heated in boiling water and a piece of the rhizome is held against a painful tooth (by means of a stick) as a warm dressing.	W: Plumtree
												x	lf rh	The leaf or rhizome is used together with other plant species as an aphrodisiac.	

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		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
41	*S. pearsonii* (-)										x		ep	A whole *Sansevieria* population consisting of many plants is used as a shrine for ancestral worship, for families to make contact with their ancestors.	W: Kosted farm, Collenborne
42	*S. aethiopica* (-)		x										lf	For treating ear infections. Leaf put in fire and exuded liquid squeezed into infected ear.	W: Plumtree, Nxele
43	*S. aethiopica* (-)		x										rh	Treating toothache. Rhizome boiled in water and pressed on aching tooth as warm dressing.	W: Plumtree
44	*S. hyacinthoides* (-)									x			lf	Fiber is used to make whip ends.	W: Nyamandlovu, near Mahlothovu school
45	*S. kirkii* (Takawira 112)		x								x		ro	Roots are used for detoxification. Tiny roots growing off the rhizome are ground and dried, boiled in water and mixture administered to someone who has been bewitched so they can vomit. Also used as a purgative for cleansing the stomach.	N: Sinampande area, Binga
46	*S. kirkii* (Takawira 112*)											x	ep	Used as a hedge to separate two homesteads. Grown as a windbreak and useful for trapping dust on windy days.	N: 88 km from Binga, along Siabuwa Rd., Sinampande area, 500 m after Sinampande area
47	*S. hyacinthoides* (-)		x							x			lf	Fiber is used to make whip ends and the broad leaves are warmed and used as a warm dressing on a sprained ankle.	S: Chivi, Tarukwasha village
48	*S. pearsonii* (-)											x	lf	Leaf strands used for harvesting termites (known as **Manjuru eruhwani**) from termite mounds.	S: Chivi, Tarukwasha village

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		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
49	*S. pearsonii* (-)		x					x	x				lf	The leaf is crushed and used to make door mats.	S: Chivi, Zihwa/ Muzenda village
	S. hyacinthoides (-)		x										rh	Rhizome added to a local non-alcoholic beverage is taken by pregnant women to prepare the birth canal and prevent delivery complications.	
			x										rh	Rhizome is boiled in water and the warm mixture is given to a person with aching tooth to keep in the mouth for up to two minutes before spitting out the mixture.	
50	*S. pearsonii* (-)											x	rh	Rhizome is crushed and the exuded sap expressed into a dog's nose or added to its food to improve ability to trail game during hunting.	S: Chivi, Tarukwasha village
		x											ep	Grown together with *Aloe* species and other succulents on rockeries as ornamentals and sometimes together with *Haworthia* species for protection against lightning.	
51	*S. hyacinthoides* (-)		x										lf	Leaf is used as a warm dressing for treating a sprained ankle.	S: Chivi, Tarukwasha village
52	*S. hyacinthoides* (-)					x							lf	Leaf is used by children for play as they sit on the broad leaves and slide down slopes.	N: Great Dyke Pass
53	*S. hyacinthoides* (-)		x										rh	Rhizome is mixed with other tree species to make mixture taken for treatment of venereal diseases (e.g., gonorrhea, syphilis).	N: Great Dyke Pass
54	*S. hyacinthoides* (-)						x						lf	Fiber is extracted and used to make rope that is used to tie poles during thatching of huts.	C: Selous, Chegutu

Respondent #	Species (voucher)	Use Categories											Part used	Explanation of use and mode of administration	Flora Zambesiaca region: Location
		Ornamental	Human medicine	Animal medicine	Food	Play	Processed fiber	Unprocessed fiber	Crafts	Whip ends	Spiritual use	Other			
55	*S. pearsonii* (-)											x	ep	Entire plant grown as a hedge around homestead.	C: Selous, Chegutu
												x	lf	Strand pulled from leaf is inserted into hole on termite mound for harvesting edible termites.	
56	*S. aethiopica* (Takawira 101)		x										lf	Treatment of ear infections. The leaf is warmed over a flame and the exuded sap squeezed into infected ear.	W: Plumtree, Zimbabwe and Botswana border
57	*S. aethiopica* (Takawira 101*)		x										ro	Roots soaked in warm water and mixture given for dehydration in babies.	W: Plumtree, Zimbabwe and Botswana border
58	*S. aethiopica* (Takawira 95)		x										lf	Used for treatment of ear infections. Leaf is warmed on fire and the warm sap squeezed into infected ear for both adults and children.	W: Makwa Village, along Khami road
59	*S. aethiopica* (Takawira 96)		x										lf	Used for treatment of ear infections. Leaf warmed on fire and warm leaf sap squeezed directly into infected ear.	W: Mbonqane near Khami Ruins
60	*S. aethiopica* (Takawira 100)		x										lf	Used for treatment of ear infections. Leaf warmed on fire and sap squeezed directly into infected ear.	W: Grilisi, Solusi

corded were on four species shown in Figure 2. *Sansevieria pearsonii* was the most mentioned species (Figure 3).

Ethnicity, age and gender of respondents

Of the 60 respondents, almost half (29) were from the Ndebele ethnic group (Figure 4). Demographic response distribution is shown in Table 3. The responses from men and women were combined for data analyses.

Ethnotaxonomy

Almost all the respondents interviewed knew at least one local name for each *Sansevieria* species that occurred in their area. The local names were based on morphological features, habitat preferences and the use of *Sansevieria* species that occurred in their area. Some of the names had no apparent meaning. Table 4 gives a summary of the ethnotaxonomy of the genus *Sansevieria* in

Table 3. Age and gender information for 60 informants interviewed in Zimbabwe about their ethnobotanical knowledge of *Sansevieria* species.

Age group (years old)	Male	Female	Total
less than 15	10	5	15
16-30	5	2	7
31-45	12	7	19
46-60	11	4	15
61-90	0	4	4
Total	38	22	60

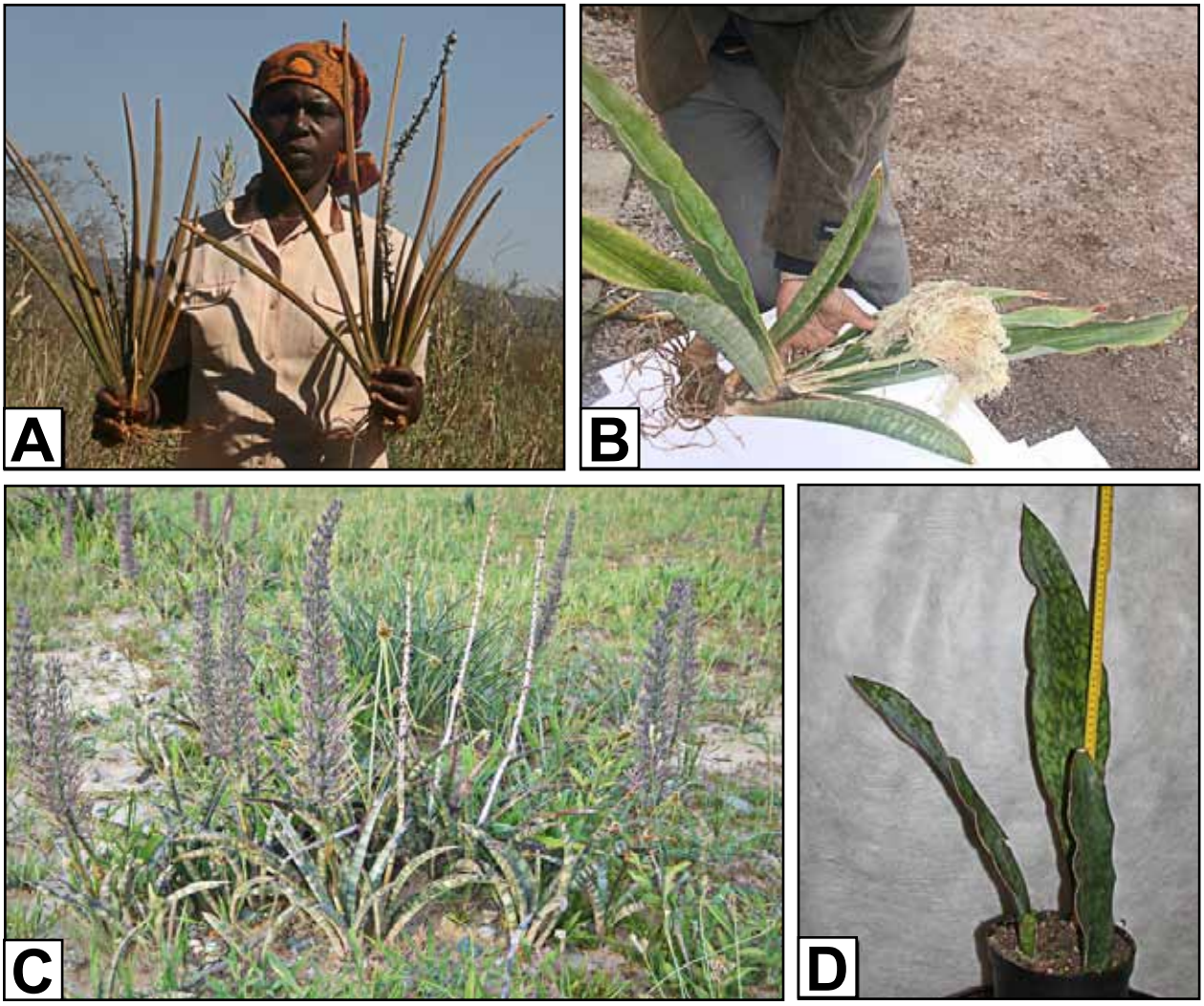

Figure 2. Four *Sansevieria* species for which ethnobotanical data were recorded from interviews with 60 informants in Zimbabwe: **A**) *Sansevieria pearsonii* N.E.Br.; **B**) *Sansevieria kirkii* Baker; **C**) *Sansevieria aethiopica* Thunb.; and **D**) *Sansevieria hyacinthoides* (L.) Druce. (Photographs A, B and C taken by R. Takawira Nyenya, D taken by Brita Stedje.)

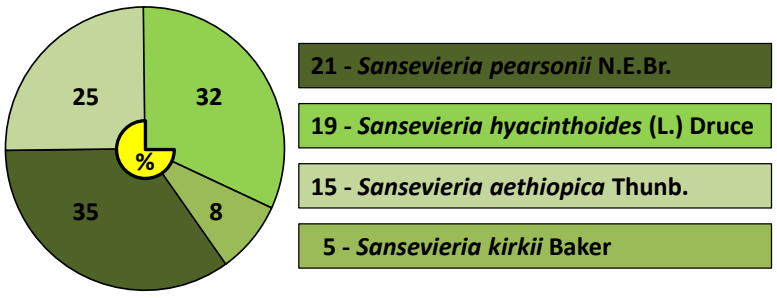

Figure 3. Percent and number of times different *Sansevieria* species were reported in 60 interviews in Zimbabwe.

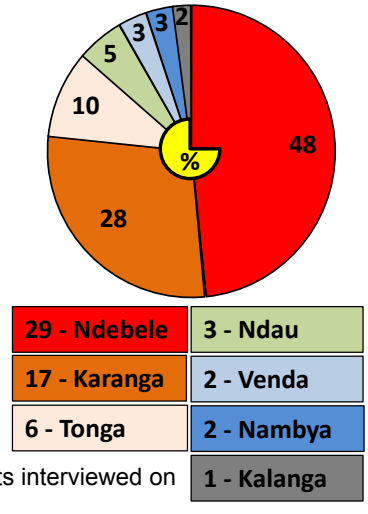

Figure 4. Ethnic group representation, in percent and number of the 60 respondents interviewed on the uses of *Sansevieria* species in Zimbabwe.

Table 4. Local plant names for *Sansevieria* and their meanings as reported by 60 informants interviewed in Zimbabwe.

Species	Common name used in folk taxonomy and language	Literal meaning of folk name	Folk taxonomy aspect
Sansevieria aethiopica Thunb.	**Isikusha seganga** (Ndebele)	Wild plant used for fiber and making rope.	Reference to utility of species for making rope and its indigenous nature as compared to the introduced *Agave sisalana* Perrine ex Engelm.
	Isikusha sephane (Ndebele)	Plant used for making rope that grows in a vegetation type dominated by the tree species *Colophospermum mopane* (J. Kirk ex Benth.) J. Léonard.	Refererence to the ecology of the species with reference to the tree species it grows in association with in the wild, *C. mopane.*
	Isikusha (Ndebele)	Plant used for fiber and making rope.	Reference to utility of species for making rope.
	Indlebe yebhalabhala (Ndebele)	Zebra's ear.	Reference to leaf morphology: A description of the plant's habit, reference to the light green and green horizontal bands of the leaf typical of *S. aethiopica* and their resemblance to the alternating line of a zebra.
	Umshaba (Ndebele)	No apparent meaning.	None.
	Tshikopa (Venda)	No apparent meaning.	None.
	Chikusha (Venda)	Plant used for fiber and making rope.	Reference to utility of species for making rope.
	Isikolokotho (Ndebele)	No apparent meaning.	None.
Sansevieria hyacinthoides (L.) Druce	**Zvikonje** (Karanga)	'**Konje**' means rope	Reference to utility of species for making rope.
	Isikusha seganga (Ndebele)	Wild plant used for fiber and making rope	Reference to utility of species for making rope and its indigenous nature as compared to the introduced *A. sisalana*.
	Nyanga ya peni (Shona)	Peni's horn	Reference to the acute end of the leaf that is as sharp as a horn of an animal dubbed 'Peni'
	Chikwenga (Ndau)	No apparent meaning.	Name collectively used for all the species of *Sansevieria* and has been extended also to *A. sisalana* based on its utility for making fiber and rope.
	Masavamhanda (Karanga)	'**Mhanda**' is a Karanga word for a bifurcation or a fork of a tree. The common name literally means a plant used for fiber that grows on a tree fork.	A description of a fiber species *S. hyacinthoides* growing on a *C. mopane* tree trunk between two forks of a tree stump. (Observed during fieldwork).
	Masava (Karanga)	No apparent meaning.	None.
	Isikusha (Ndebele)	Plant used for fiber and for making rope.	Reference to utility of species for making rope.

Species	Common name used in folk taxonomy and language	Literal meaning of folk name	Folk taxonomy aspect
S. hyacinthoides	**Isikusha seganga** (Ndebele)	Wild plant used for fiber and making rope.	Reference to utility of species for making rope and its indigenous nature as compared to the introduced *A. sisalana*.
Sansevieria kirkii Baker	**Makusa** (Tonga)	Plant used for fiber and for making rope.	Reference to utility of species for making rope.
	Mukonje (Tonga)	'**Konje**' means rope.	Reference to utility of species for making rope. '
	Musombo (Nambya)	Plant used for fiber and for making rope.	Reference to utility of species for making rope.
Sansevieria pearsonii N.E.Br.	**Sharamhanda** (Karanga)	'**Mhanda**' is a Karanga word for a bifurcation or a fork of a tree. The common name literally means a plant that grows on a tree fork.	A description of a fiber species *S. pearsonii* growing on a tree trunk between two forks of a tree stump.
	Musombo (Tonga)	No apparent meaning.	None.
	Mukonje (Tonga)	'Konje' means rope.	Reference to utility of species for making rope.
	Musombo (Nambya)	No apparent meaning of name.	None.
	Isishaba/ Umshaba (Ndebele)	Plant used for fiber and for making rope.	Reference to utility of species for making rope.
	Masavamhanda (Karanga)	'**Mhanda**' is a Karanga word for a bifurcation or a fork of a tree. The common name literally means a plant used for fiber that grows on a tree fork.	A description of a fiber species *S. pearsonii* growing on a tree trunk between two forks of a tree stump.
	Isikolokotho (Ndebele)	No apparent meaning.	None.

Zimbabwe, including the meaning of the names. Several of the names mentioned were related to the use of *Sansevieria* for rope. The names sometimes had two components like the Ndebele common name for *S. aethiopica*; **isikusha sephane**, meaning a plant used for making rope that grows in association with the tree *Colophospermum mopane* (J. Kirk ex Benth.) .) Kirk ex J. Léonard. Other names were related to their ecology or their resemblance to parts of wild animals, like "Zebra's ear" for *S. aethiopica* and "Peni's horn" for *S. hyacinthoides*. Use of common names does in some cases, lead to confusion. In the eastern parts of Zimbabwe, the name **chikwenga** is used for both *Sansevieria* species and *Agave sisalana* Perrine ex Engelm. as a common name for plants used for the extraction of fiber. In other places, a distinction between the two was made and *Sansevieria* was referred to as the wild plant used for making fiber and rope.

Plant parts used

The leaf was reported as the main plant part used and was cited 47 times (Figure 5). This accounted for 71% of the uses.

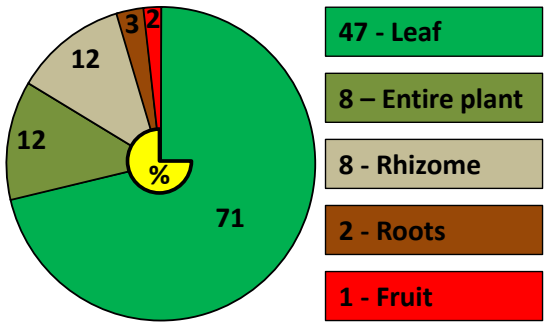

Figure 5. Percent and number of reports on the plant part used for every ethnobotanical use recorded from interviews with 60 informants in Zimbabwe.

Use categories

A total of 11 use categories were identified in this study. The percent of reports for each use category for all species of *Sansevieria* taken together are presented in Figure 6.

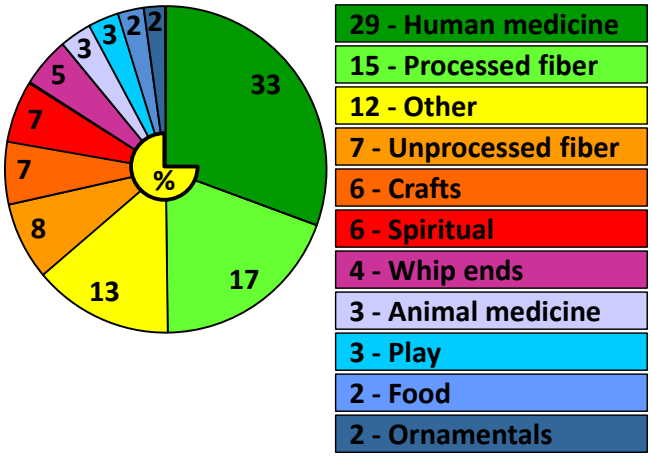

Figure 6. Percent of reported uses of *Sansevieria* plants recorded from interviews with 60 informants in Zimbabwe.

Ornamentals

The ornamental use category was defined as the growth and use of *Sansevieria* for decorative purposes. Only two reports were recorded for this category, one each for *S. aethiopica* and *S. pearsonii*.

Medicinal use in humans

The medicinal use in humans category included all medicinal uses and the ailments treated using *Sansevieria*. It accounted for 24 of the total number of reports. All four species were reported for this category, with *S. aethiopica* use most commonly reported.

The most often reported medicinal use in humans was applying *S. aethiopica*, *S. hyacinthoides* or *S. pearsonii* for treatment of earache or ear infections, with *S. aethiopica* being used most commonly reported. The most frequent method used was to heat a leaf over fire and to squeeze the exuded sap into the infected ear. One informant also reported on the use of the rhizome in the same way. The use of *Sansevieria* for treatment of ear infections was reported consistently during this study by members of various ethnic groups, who made use of the species that occurred in their respective areas.

One report was given on women using *Sansevieria* for treatment of premenstrual tension, while two reports recorded the use of *S. hyacinthoides*, *S. kirkii* or *S. pearsonii* for alleviating labor pains and for preventing complications when giving birth. One informant reported that the rhizome of *S. hyacinthoides* was crushed in water and the mixture added to a local non-alcoholic drink made from maize meal known as **mahewu**, and given to a pregnant woman to drink to facilitate safe delivery. One report on the use of *S. hyacinthoides* by men for treating venereal diseases was recorded. Polygamous men were said to use the same species to prevent transfer of venereal diseases from one wife to another. The rhizome of the same species was said to be used as a component of the venereal disease medicine while the roots are used as a purgative. The leaf sap, rhizome or roots of *S. hyacinthoides* were also reported as used for treating dehydration and colic in babies, while *S. aethiopica* is used for treatment of dehydration in infants.

Two respondents reported on the use of *Sansevieria* leaves as a warm dressing for a sprained ankle. The broad leaves of *S. hyacinthoides* are heated in hot water and wrapped around the ankle. Various respondents reported on the use of the same species for treatment of a wide range of ailments and for the treatment of stomach pains in particular. The rhizome of *S. hyacinthoides* was reportedly added to bath water for treatment of measles and urticaria. Informants from Binga reported on the use of *S. kirkii* for treating sore eyes and as a purgative for the stomach.

Medicinal use in animals

Three reports on two species, *S. pearsonii* and *S. hyacinthoides*, were given for this category. The leaves of *S. pearsonii* are crushed and given to cattle suffering from stomach acid back flow. The same medicine is also administered to livestock, especially goats, as a component of fertility treatments. The informant was however, quick to warn that the same concoction was poisonous when given to humans. The species *S. hyacinthoides* was reported as useful in detoxification of a poisoned dog. The berries were crushed and added to the dog's food to make it vomit.

Food

Two uses of *Sansevieria* for food were reported for *S. aethiopica* and *S. pearsonii*. These species were reportedly eaten by livestock and cattle in particular in times of drought. No reports were given for the use of any of the *Sansevieria* species as food by humans.

Play

This category includes three reports on uses of *Sansevieria*. Rope extracted from the leaves of *S. pearsonii* was reportedly used for making volley ball nets and skipping

rope. The broad leaves of *S. hyacinthoides* are used by children for sitting on when sliding down slopes.

Processed fiber

Processed fiber includes reports on making rope or string from fiber extracted from *Sansevieria* leaves. It formed the second largest use category with 15 reports. *Sansevieria pearsonii* was the species most frequently reported.

Different methods of extraction of fiber from leaves were reported. One informant demonstrated extraction of fiber from leaves using a metal object like a blunt knife or a shovel (Figures 7 A, B). The leaf was moved back and forth on the rough edge until the white fiber had been extracted. Sometimes the leaves were split longitudinally prior to extraction. Other respondents mentioned using a stone to gently crush the leaf, and then hitting the leaf against a tree stump to macerate the tissues until just the fiber remained. In both cases the extracted fiber was intertwined to make a string of desired thickness as shown in figures 7C and D.

Some informants stated their preference for certain *Sansevieria* species as a source of fiber based on the relative strengths of the fibers. The fiber from *S. pearsonii* was reported as weaker compared to that from *S. hyacinthoides*. The leaves of *S. hyacinthoides* were, however, reported to have less fiber per leaf when compared to *S. pearsonii*, and hence more leaves were harvested and more time was used for fiber extraction from *S. hyacinthoides*.

Unprocessed fiber

A total of 7 reports were recorded for this category. This category was kept separate from the processed fiber category because the methods of preparation were different. When using unprocessed fiber, the user just shredded the outer tissue of the leaf using fingers or a sharp object, tied the strands end to end, and used the simple rope made

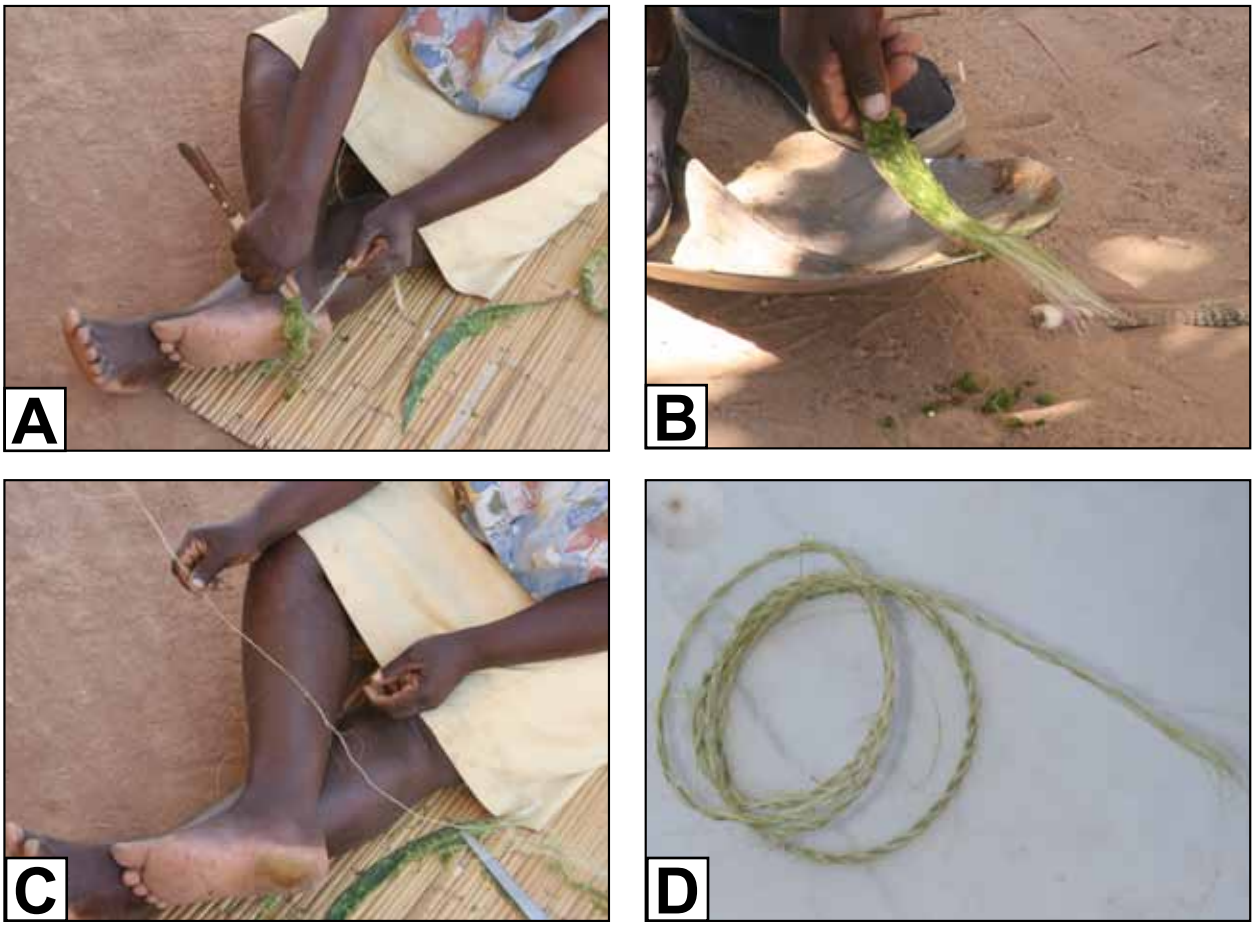

Figure 7. Extraction of fiber from *Sansevieria hyacinthoides* (L.) Druce leaves in Zimbabwe: **A**) Placing part of the leaf on one's foot and scrapping off the leaf tissue with a knife until the fiber is extracted; **B**) Rubbing the leaf against a rough edge, in this case a shovel, until the fiber is extracted; **C**) Intertwining of fiber strands to make a string; **D**). String made from *S. hyacinthoides* fiber. (Photographs taken by R. Takawira Nyenya.)

for tying bundles of firewood or thatching grass, without further extraction of the fiber.

Crafts

This category included use of species of *Sansevieria* for making crafts such as baskets, hats, or table and door mats. Fiber is extracted from the leaves as mentioned above, and used to make string of preferred thickness which is used for making various crafts. In some cases like weaving mats from *S. pearsonii*, prior extraction of fiber is not necessary as the whole leaf is gently crushed with a stone and used as it is to weave the mats as shown in Figure 8.

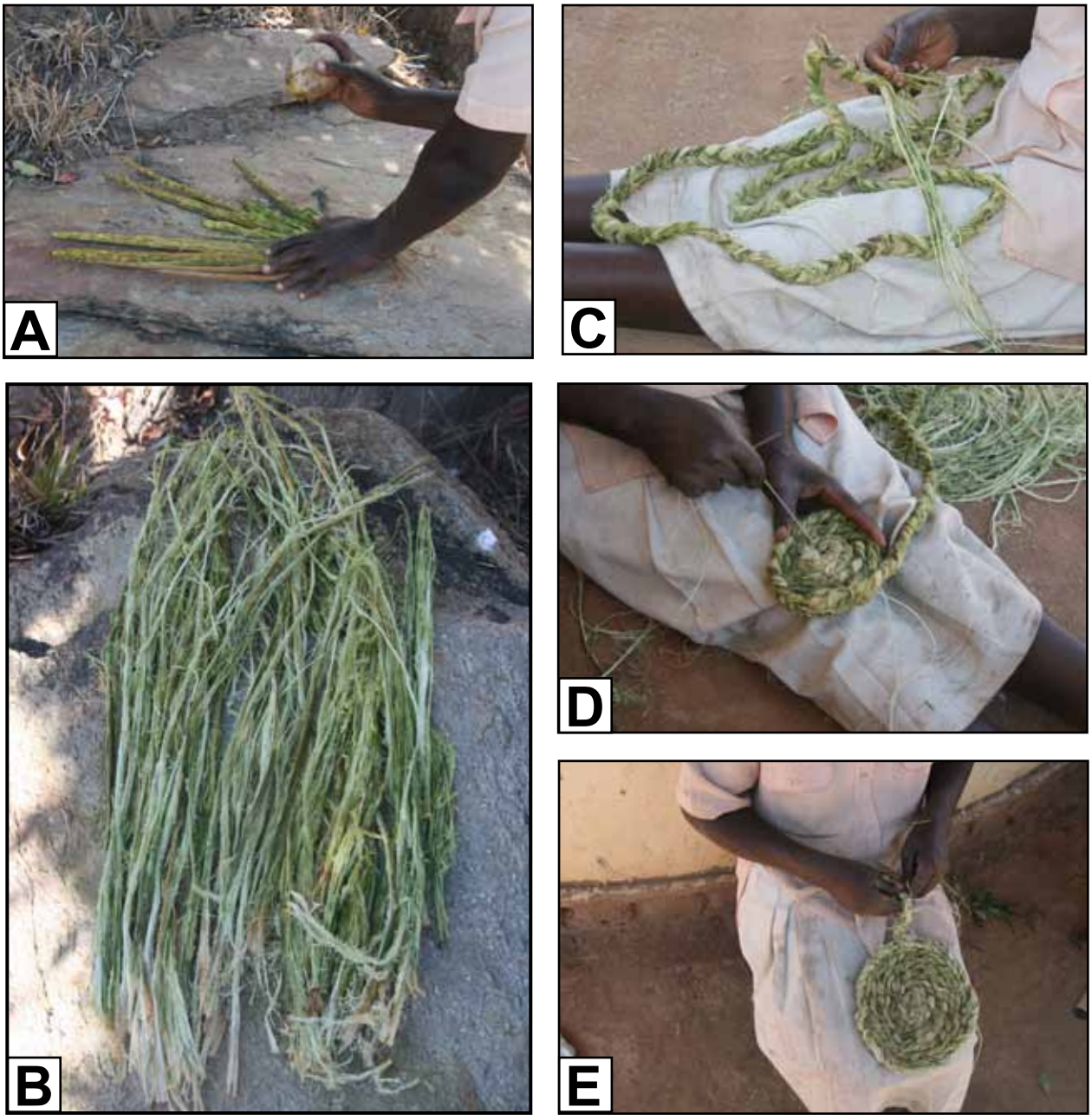

Figure 8. The process of making mats from *Sansevieria pearsonii* N.E.Br. leaves in Zimbabwe: **A**) The leaves are gently crushed with a stone to macerate the tissues; **B**) The crushed leaves are shredded into strands using fingers; **C**) The leaf strands are divided into three parts which are braided together into one thick flat rope. **D**) and **E**) The flat rope is neatly sewn together into a mat using fine string made from *Sansevieria hyacinthoides* (L.) Druce leaves. (Photographs taken by R. Takawira Nyenya.)

Mat making from *S. pearsonii* was reported as mainly done after the farming season, although harvesting of the species could be carried out throughout the rainy and farming seasons when the leaves were thought to be at their strongest. The harvesting process includes collecting the leaves and gently crushing the leaf tissue with a stone until the tissue is macerated. The macerated leaves were used immediately for making mats or alternatively, they were dried to reduce the water content and then stacked in a bag until a time when they could be used for making mats. To prepare the leaves for making mats after drying, they were sprinkled with water to make them soft and pliable for braiding. The flat rope made is later sewn into mats as shown in Figures 8 C, D and E.

One informant reported dying the white fiber into various colors before using it for making crafts. Fiber from *S. hyacinthoides* was dyed using the bark of *Pterocarpus angolensis* DC., *Berchemia discolor* (Klotzsch) Hemsl., or *Parinari curatellifolia* Planch. ex Benth. to give a brown color. The fiber was boiled between layers of bark for 3 to 4 hours to give a brown color or, with black ash added, to produce a black color. Povidone-iodine was used in the boiling process where the desired fiber color was purple. The informant further explained that *S. pearsonii* fiber was in most cases, used without dying due to the fact that it was believed to be weaker than the fiber from *S. hyacinthoides* and that the boiling process could further weaken the fiber.

Making whip ends

The whip ends category included the use of fiber extracted from *Sansevieria* for making extensions to whips. The main part of the whip was made using tree bark from various species (e.g., *Brachystegia spiciformis* Benth. or *Julbernadia globiflora* (Benth.) Troupin). The whip extensions make a sharp, cracking sound considered important for driving flocks or herds in a particular direction. These whips are commonly used by cattle herders in Zimbabwe. The sound produced is unique among herders depending on the thickness and quality of fiber used to make the whip extensions. Users also communicate effectively through the whips using predetermined 'codes' such as producing a sound an agreed number of times.

Spiritual uses

This category includes reports on uses of *Sansevieria* populations as a shrine for encountering the dead during ancestral worship and growing *Sansevieria* species on graves. Growing *S. pearsonii* on graves was observed in Birchnough Bridge, among the Karanga people, while *S. aethiopica* was grown by the Ndebele people in Lupane. One Kalanga respondent reported on the growth of *S. pearsonii* around a homestead as a shrine for ancestral worship.

Other uses

This category includes the uses of leaf strands of *S. pearsonii* for harvesting edible termites; use of *S. hyacinthoides* flowers in the breeding of guinea fowls; the growth of *S. kirkii* as a hedge or wind breaker, and for trapping dust. Also included in this category was the use of *Sansevieria* species as an aphrodisiac, and beliefs that *Sansevieria* species can scare off snakes and keep away lightning.

The use of *S. pearsonii* for harvesting edible termites is an important source of livelihoods in the southern part of Zimbabwe where women harvest termites, locally known as **manjuru** or **manjuru eruhwane** (Figure 9). The termites are eaten as relish with a staple food made from maize meal known as **sadza**. The termites are also sold or bartered for other goods.

One informant mentioned preference of *S. pearsonii* over *S. hyacinthoides* in the harvesting of termites due to the leaves being straight and rigid hence they can easily go into the termite hole compared to the flexible leaves of *S. hyacinthoides*.

Use categories for each Sansevieria species

Table 5 presents the number of responses for each of the use categories for the four *Sansevieria* species in this study. All four species were utilized for medicine in humans, making rope from processed fiber, as sources of unprocessed fiber and for spiritual use. It is evident that *S. pearsonii* is a multipurpose species, as it is the only species mentioned for all 11 use categories. This could be due to its wide distribution across the country compared to the other three species whose distribution is more restricted. The species *S. aethiopica* was the most cited in the medicinal plant category.

Uses related to ethnic groups.

The use of *Sansevieria* for fiber was common for all ethnic groups represented, and respondents reported on the use of the *Sansevieria* species that were available in their vicinity. One comment by the respondents in Matopo in southern Zimbabwe was that they used the species *S. pearsonii* that occurred close to their homes for making fiber and for treating ear aches because the preferred species, *S. hyacinthoides*, grew in the mountains, far from their homestead.

In our study, certain uses were unique to particular ethnic groups. The Ndebele tribe in Matopos, south Eastern parts of Zimbabwe reported on the use of *S. pearsonii* to make ceremonial garbs, while a Kalanga respondent reported on the use of tips of young leaves of *S. pearsonii* for beating drums for a typical traditional dance in the area, locally known as **umgido wa mabhiza**, literally meaning 'the horses' dance'. Neither the dance nor

the use of *Sansevieria* leaves for drumming was reported elsewhere in the country.

Discussion and Conclusion

Although at least eight *Sansevieria* species are known to occur in Zimbabwe (La Croix 2010, Takawira-Nyenya 2006) ethnobotanical data reported in this study were from only four species. These were the only species found in the areas visited during this study. The species *Sansevieria stuckyi* God.-Leb., *Sansevieria fischeri* (Baker) Marais, and an unidentified species were only known in Zimbabwe from cultivated specimens and the records at the National Botanic Garden. Efforts to locate these spe-

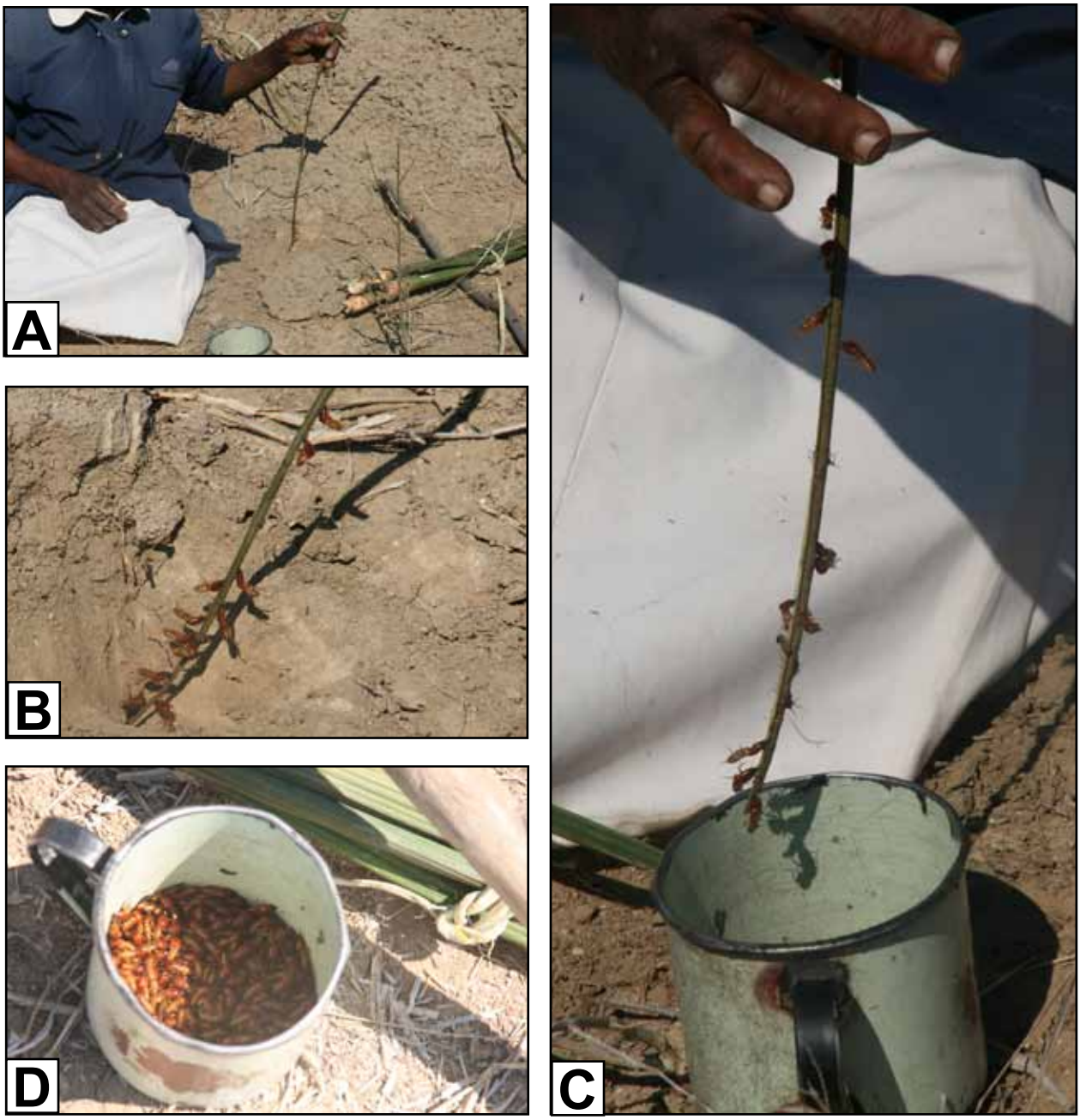

Figure 9. Harvesting edible termites using *Sansevieria pearsonii* N.E.Br. leaves in Zimbabwe: **A**) A thin strand shredded from a leaf is inserted into the termite hole where it is left for about a minute; **B**) The leaf strand is gently pulled out of the hole. The termites are seen here with their mandibles biting onto the leaf strand; **C**) The harvested termites are stripped into a container and the leaf strand is reinserted into the termite hole; **D**) Live termites in a container after harvesting. (Photographs taken by R. Takawira Nyenya.)

Table 5. Number of responses for different use categories reported for each of four *Sansevieria* species recorded from interviews with 60 informants in Zimbabwe.

Use category	Number of reported uses per species				Use total
	***Sansevieria pearsonii* N.E.Br.**	***Sansevieria hyacinthoides* (L.) Druce**	***Sansevieria aethiopica* Thunb.**	***Sansevieria kirkii* Baker**	
Human medicine	2	12	12	3	**29**
Processed fiber	6	5	2	2	**15**
Other	6	2	2	2	**12**
Unprocessed fiber	3	2	1	1	**7**
Crafts	2	3	1	0	**6**
Spiritual	3	1	1	1	**6**
Ornamental	1	0	1	0	**2**
Whip ends	1	3	0	0	**4**
Animal medicine	2	1	0	0	**3**
Play	2	1	0	0	**3**
Food	1	0	1	0	**2**
Total	**29**	**30**	**21**	**9**	**89**

cies in the wild during fieldwork were in vain as they could not be found even in localities from which they had been previously collected or located. *Sansevieria hallii* Chahinian was found in one locality in Masvingo south but no reports were recorded on its use.

In this study the Ndebele tribe was overrepresented relative to their representation in the total population of Zimbabwe. We do not think that this is an indication that the Ndebele people are more familiar with using *Sansevieria*, but that the bias is partly coincidental and partly because some reports included here were collected during field studies that the first author participated in carried out for a separate research project in Matabeleland, a region mostly inhabited by the Ndebele.

The use of *Sansevieria* species for the treatment of common ailments, like earache, by people from various ethnic groups in Zimbabwe indicates that ethnobotanical information on medicinal uses is shared within and among communities through intermarriages, by association, or simply by word of mouth. Heinrich *et al*. (1998) observed that potential medicinal plants were passed from one area to another because they were perceived effective. Kristensen & Lykke (2001) found that some ethnic groups had their own unique knowledge on plant species use. This was also true for this study regarding spiritual uses and traditional dancing.

The distribution of gender among the respondents in this study deviating from the common 1:1 ratio. It may also contradict earlier studies reporting limited knowledge on plant use among young people (Srithi *et al*. 2009, Voeks 2007). In our study ethnobotanical data were collected alongside collection of plant material for a taxonomic study. This may have affected the age and gender distribution, as men and young people were more frequently encountered in the wild, than women who traditionally are associated more with the homesteads. It may also be that Zimbabwean youngsters are particularly knowledgeable on the use of *Sansevieria* because of the plant's importance for treating ear ache, an ailment common among children, and for their uses for play.

The local names of *Sansevieria* were based on morphological features, habitat preferences and the use of *Sansevieria* species that occurred in the area. However, some of the names had no apparent meaning. Kakudidi (2004) found this to be true for various plant species in his folk plant classification in Uganda. Several of the local names of *Sansevieria* species given by the respondents were related to the use of *Sansevieria* for rope. This could be an indication that use of fiber was regarded as the most common and well known use for the genus. Some common names are related to the ecology of the plants and show that local people are aware of the ecological aspects of *Sansevieria* habitats in the wild. The respondents had knowledge that distinguishes the genus *Sansevieria* from other plants, with exceptions of isolated cases where *A. sisalana* was mistaken for *Sansevieria*. This could have been caused by the common use of the two genera for fiber.

The treatment of ear infections using *Sansevieria* was the most common medicinal use reported in this study. The use has been reported in Zimbabwe by Gelfand *et al*.

(1985), in Kenya (Khalumba *et al*. 2005, Takawira-Nyenya *et al*. n.d.) and in South Africa (Van Wyk *et al.* 2008), indicating the sharing of ethnobotanical knowledge across country borders. As far as we know, the use of *Sansevieria* in maternal health and child care has not been reported earlier. The uses of *Sansevieria* for play by children, for making whip ends, harvesting termites and as an aphrodisiac have also not been reported earlier in Zimbabwe.

One male informant from the eastern parts of Zimbabwe mentioned the use of the *S. hyacinthoides* rhizome for treating and preventing the spread of venereal diseases. Earlier reports on the use of *Sansevieria* for the treatment of venereal diseases have been documented in Kenya, but only the leaves have been used for this purpose (Kiringe 2006).

The use of *Sansevieria* for fiber was common for all ethnic groups represented and the practice is also common in South Africa (Van Wyk & Gericke 2000) and Kenya (Takawira-Nyenya *et al*. n.d.). In our study the preferred species for extracting fiber was *S. hyacinthoides*, but respondents reported that they substituted it with other species like *S. pearsonii* when *S. hyacinthoides* was difficult to access.

Which part of a plant is used has implications on the sustainable utilization and conservation of species. Methods of harvesting the leaf for all species of *Sansevieria* involves gently shaking the leaf sideways and pulling until it is detached from the rhizome, a process that is quite simple and usually leaves the rest of the plant and the rhizome unharmed. Since vegetative propagation of *Sansevieria* occurs mainly through the rhizome, this method of harvesting without digging up the rhizome helps preserve its populations and reduce the damage of harvesting.

From a management and sustainable utilization point of view, harvesting of leaves is more sustainable than harvesting underground parts, the rhizome or the entire plant (Giday *et al.* 2003, Srithi *et al.* 2009). Cunningham (1996) observed a relationship between the parts of plants collected by users, the collection methods used, and the impact of harvesting on the plant. Similar studies have highlighted that widespread use of leaf material for herbal concoctions is less harmful to the plant than harvesting methods that include uprooting of the plants or digging up of underground parts and clearing of woodlands for farming (Kakudidi *et al*. 2000, Mwafongo *et al*. 2010).

Threats to *Sansevieria* species in Zimbabwe include human activities that result in habitat destruction and land use change such as agriculture, road and dam construction. Field studies carried out by the first author from 1997 to 2003 revealed that *Sansevieria* are among threatened taxa with their declining numbers being caused by overexploitation of certain members of the genus by local communities. Local extinction of *Sansevieria* populations has had negative impacts on other associated tree species. Mudavanhu (1998) observed that communities in south eastern parts of Zimbabwe resorted to debarking of *Adansonia digitata* L. as an alternative source of fiber following the over-exploitation and subsequent local extinction of *S. pearsonii* in the area. Following his study, he proposed a program to reintroduce *S. pearsonii* in the area to save *A. digitata* populations.

The current study has documented a wider range of uses for the genus *Sansevieria* than was previously known. It also shows that indigenous forms of medical treatment are still important among the people of Zimbabwe. Several of the uses have been reported by just one or two respondents and more investigation is needed to see if these reports represent the customs of more people or if they are isolated cases. It is hoped that this paper will form a basis for further studies on the ethnobotanical uses of the genus *Sansevieria* in Zimbabwe and in other parts of Africa where the genus is found.

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